

# **CHAPTER- I**

## **INTRODUCTION**

### **1.1 Background of the Study**

Foreign direct investment (FDI) is an important form of foreign capital flowing to both the developed as well as developing countries of the world in the form of direct investment or portfolio investment. Most economic theorists and development practitioners accept that external capital is necessary for accelerating industrialization and overall growth. FDI has been a major economic policy issue for the great majority of countries around the world. The increasing mobility of international firms and the gradual elimination of barriers to global capital flows have stimulated competition among governments to attract FDI. FDI per se is one manifestation of globalization and the world economy over the past two decades (Subedi, 2013).

Nepalese economy is passing through the critical phase of low-level equilibrium trap circumscribed by poverty and stagnation. The present level of capital formation of Nepal is too low and any substantial increase in saving is not possible due to low level of income and wide spread of poverty. At this juncture, one of the alternatives to pull the economy out of the vicious circle of poverty is the foreign capital. In fact, it is supplement to fulfill the deficiency of the domestic capital. Hence, most of the developing countries irrespective of their size and political systems are now trying to attract foreign investment. A larger number of developing countries have now established Export Processing Zones (EPZ) to attract foreign investment (Dahal, 2007).

FDI is also considered important since it imports with it managerial skills, technologies, employment opportunities, training opportunities etc. to the recipient country. It is also a very useful tool in mobilizing internal domestic saving (Gyawali, 2007).

Theories of FDI suggest that national and foreign private sector enterprises, if permitted to operate in a competitive market condition, offer developing countries the best prospects for faster national economic growth. This would provide opportunity to add new resources-capital, technology, management and marketing- to the host

economy ensuring efficiency and stimulates change. FDI offers advantages in terms of export market access arising from economies of scale in marketing of foreign firms or from their ability to gain market access abroad and also helps in bridging country's foreign exchange gap (Koirala, 2006).

Foreign direct investment (FDI) is an integral part of an open and effective international economic system and a major catalyst to development. Yet, the benefits of FDI do not accrue automatically and evenly across countries, sectors and local communities. National policies and the international investment architecture matter for attracting FDI to a larger number of developing countries and for reaping the full benefits of FDI for development. The challenges primarily address host countries, which need to establish a transparent, broad and effective enabling policy environment for investment and to build the human and institutional capacities to implement them (OECD, 2002).

FDI is identified as a medium to acquire skills, knowledge, technologies and to internationalize business and at the same time to reduce debts. Noorbakhsh (2001) believe that FDI does not take place automatically and, therefore, inflow of FDI should be encouraged.

FDI, also known as (international) direct investment, forms a part of the capital account of the balance of payments. 'Direct investment' is defined as an investment that adds to, deducts from, or acquires a lasting interest in an enterprise operating in an economy other than that of the investor where the purpose is to have an 'effective voice' in the management of the enterprise. According to the International Monetary Fund (IMF), FDI is the category of international investment that reflects the objective of obtaining a lasting interest by a resident entity in one economy in an enterprise resident in another economy (IMF, 2009).

The openness of the economy with the rest of the world has significant effect on liberalization in terms of trade. The open economy encourages more confident investment. Other than trade liberalization, financial liberalization is also important to sustain capital inflows. Countries welcome FDI for its various potential benefits. These include employment creation, capital accumulation, transfer of technology, improved provision of services and increased competition (UNCTAD, 2006). Contrary to such positive views, skeptical views run against FDI. Skepticism suggests

inward FDI can also impose costs in the form of displacement of local firms and workers and possible monopolistic practices, and there can be valid economic rationales for restricting inward FDI. Staying away from economic rationales, political and social views follow a high-handed approach in denouncing FDI. There may also be non-economic reasons for limiting foreign ownership and control, relating to national security or economic nationalism.

Current financial and economic crises erupting since 2008 have downplayed the agenda of investment attraction through liberalization and protection of foreign investors. In this respect, Nepalese case per se is unique as its agenda for economic transformation has been shadowed in a hazy and hostile political situation. This process emerged when the country was facing years of internal war, which shattered the goal of inviting FDI.

## **1.2 Statement of the Problem**

The ultimate goal of development is to reduce poverty and improve standard of living. For this to happen, sustainable economic growth and investment in people are necessary. However, give the prevalence of resources constraint, poorer countries like Nepal should seek support from donors in the form of aid for financing project and programmes in needy areas.

Nepal is one of the liberalized countries in the South Asian region. However, growth performance has been very poor in recent years. In this context, a closer examination of the linkages between foreign direct investment and growth is critically important from a policy point of view. There are highly liberal FDI and GDP related policies supplemented by important Acts. In the aftermath of liberalization that began in the early 1990s, FDI increased substantially. However, that could not be sustained for long. After becoming a World Trade Organization (WTO) member in 2004, Nepal has been pursuing further opening up and liberalization policies on the FDI. Nepal is also the member of the South Asian preferential trade Arrangement (SAPTA) and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic cooperation-Free Trade Area (BIMSTEC-FTA). New initiatives on FDI have been taken with the aim of enhancing sustained growth and reducing poverty.

For a least developed-country (LDC) like Nepal with huge saving-investment gap, limited albeit growing revenue to gross domestic product (GDP) ratio and limited amount of foreign aid flow, foreign direct investment (FDI) is considered an indispensable mode of development financing. Nonetheless, FDI is an important indicator to boost economic growth of Nepal. At a time when the country is striving for strengthening its infant republican democratic system, political and economic agenda should go hand-in-hand. Whatever the nature or size of system the country is going to switch over to, the future state will have to ultimately deliver in economic terms to common people. If the peace dividend is delivered, the system-in-design will sustain and vice versa. Keeping it in mind, sound preparedness is a must for economic prosperity. Alleviating poverty in a period of ten years in Nepal may require at least 8 per cent of sustained growth in GDP. On top, growth has to be converted into inclusive growth as long as possible. Such quantum and nature of growth is attainable only when FDI boosted investment will come true. It is an irony that the size of FDI to Nepal has been meager for a long time. Now the time has come for Nepal to make an honest introspection and retrospection so that a set of prudent and pragmatic measures could be designed accordingly at both policy and operational levels in the times ahead.

In this context, this thesis tries to find the relationship between FDI and GDP which is very essential for the policy maker. This research paper answers the following research questions:

- i. What is the trend of foreign direct investment of Nepal?
- ii. What is the relationship of gross domestic product and foreign direct investment of Nepal?

### **1.3 Objective of the Study**

The general objective of the study is to estimate the impact of foreign direct investment on gross domestic product of Nepal. The specific objectives are given as following points:

- i. to study the trend of the real Gross Domestic Product and Foreign Direct Investment.
- ii. to estimate relationship between real GDP and FDI of Nepal

## **1.4 Significance of the Study**

FDI has been an important avenue of private external finance for developing countries like Nepal. It differs from other types of external private capital flows in that it is motivated to a large extent by the investors' long-term goal of profit making in production activities that they directly control. FDI adds to investible resources and capital formation; and it is also a mechanism of transferring production technology, skills, innovative capacity, and organizational and managerial practices between locations, as well as of accessing international marketing networks.

As Nepal is wedged between two economically powerful nations China and India, there is high possibility of attracting FDI towards this country. For this, peace, political stability, good governance and suitable policies are crucial for creating favorable investment climate to attract the larger volume of FDI into this country. Inflow of foreign capital and skill through the foreign private investment is necessary, if Nepal's effort towards economic growth and development is to be made easier and faster. The inflow of foreign investment in Nepal is less than impressive. So, a study on the trend of foreign direct investment and its relation to the gross domestic product in Nepal would be valuable to get insight of present situation and decide about the future course of action.

Many studies are conducted to analyze the status, problems and prospects of the FDI but only few researches are there which analyzes the impact of FDI on GDP of the country empirically by using ARDL modeling. So this study has high significance as it tries to explain the exact impact of FDI on GDP and explain the long run relationship between them. Thus, this study will be very helpful for the policy maker, teachers, students, researchers as it explores the more aspects of the FDI. This research is successful to fulfill some of the research gap and put a brick in the development of the study of FDI.

## **1.5 Limitation of the Study**

In spite of the several significant as it is highlighted in the above, there are also presence some limitations in the study. It follows all systematic error which are followed by different authorities of Nepal Government during the data collection. Due to time and resource constraints, primary survey of FDI has not been conducted. So,

this study has been mainly based on secondary data to assess the analyze trend, structure of FDI of Nepal and study the impact of FDI on GDP. The study is based on data of 26 years from the adoption of liberal policy since 1990/91 to 2015/16. International comparison of policy framework is beyond the scope of this study. Simple descriptive statistical tools have been used for data analysis. Some other aspects of FDI are still left for the other studies and research.

## **1.6 Organization of the Study**

This chapter is introductory chapter. The study is completed under five chapters. Chapter one is introduction. Within this chapter following sub headings are included; general background of the study, research problem of the study, objective of the study, significance of the study, limitations of the study and organization of the study. Chapter two is review of the literatures. It is further explained by separating theoretical concepts and empirical concepts. Theoretical concepts are studies of the pre developed theories with the related research topic. Empirical concept is the studies of the existence researches, articles, Reports, bulletins etc. with the related research topic. Empirical concept is further divided into two branches; one is national context and another is the international context.

Chapter three is research methodology. Research design, sample size, description of the variables, source of data collection, method of the data collection and data analysis tools are the basic sub topics under it. Chapter four is presentation and analysis of data. Under it, whole data processing processes are determined as the demand of research problem and nature of the data.

Last chapter or chapter five is the summary of the findings, conclusions and recommendations. After the data processing major findings are summarized first and in the second they are serially concluded under conclusion sub-topic and in the proper policy recommendation is used to given to the government and institutions also under the recommendation heading.

## **CHAPTER- II**

### **REVIEW OF THE LITERATURE**

A literature is one of the two main types of review articles, the other being the systematic review. A literature review is a scholarly paper, which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. Literature reviews are secondary sources, and do not report new or original experiments work. Most often oriented literature, such reviews are found in academic journals, and are not to be confused with book reviews that may also appear in the same publication. Literature reviews are a basis for research in nearly every academic field.

#### **2.1 Theoretical Concept**

The early concept of foreign direct investments can be regarded as the development of classical theories of international trade and is originally rooted in economics. The first attempt to explain the FDI was considered a Ricardo's theory of comparative advantage. Heckscher-Ohlin (1933) theory is on the pillars for the development of the concept of international movements of capital for international trade due to the variety of resource endowments between the counties. It builds on David Ricardo's theory of comparative advantage by predicting patterns of commerce and production based on the factor endowments of a trading region. The model essentially says that countries will export products that utilize their abundant and cheap factor(s) of production and import products that utilize the countries' scarce factor(s). However, FDI cannot be explained by Ricardo's theory, since it is based on two countries, two products and a perfect mobility of factors at local level. Such model could not even allow FDI.

The microeconomic theory of international production in 1960 was introduced by Hymer (1960). This study is considered to be a landmark in the study of FDI. According to Hymer the reasons for internationalization of companies are of two kinds: variables associated to the company's dimension and ownership of specific assets and variables resulting from the existence of market failures. Hymer demonstrated that FDI only takes place when the benefits of exploiting firm-specific advantages (FSAs) across borders allow overcoming the additional costs of doing business overseas. According to Hymer's ideas, it has been argued that Multinational

Enterprises (MNEs) have firm specific advantages allowing them to operate profitably in foreign countries. Hymer noted that flow of capital was not one directional, from developed toward underdeveloped countries, however in reality after the war period, FDI was two-way among developed countries; there is either outward FDI or receive inward FDI only; the level of outward FDI was found to vary between industries, meaning that if capital availability was the driver of FDI, then there should be no variation, as all industries would be equally able and motivated to invest abroad. As foreign subsidiaries were financed locally, it did not fit that capital moved from one country to another.

Furthermore, according to Hymer (1960) and as quoted by Aliber (1969) there are two reasons for companies becoming MNEs: Market imperfections; companies became MNEs since they possess competitive advantages, and they use this competitive advantage in different countries in order to maximize their productivity and some industries due to their competitive structure would persuade companies to internationalize more than those in other industries. Nevertheless, these advantages must not be available to host country companies on the same prices and terms as to the source-country companies.

Caves (1971) consider the diversification of products as the main influencing factor. According to Caves FDI can be classified as vertical, horizontal and conglomerate. The vertical type can be further subdivided into forward and backward. Vertical FDI involves a geographical decentralization of the firm's production chain, where foreign affiliates in poorer countries typically produce labor-intensive intermediates that are shipped back to high-wage countries, often to the parent company itself. Vertical FDI is sometime referred to as "efficiency seeking" FDI, since the main motive for the investment is to improve the cost of effectiveness of the firm's production. Furthermore, vertical FDI can take two forms. There is backward vertical FDI into an industry abroad that provides inputs for a firm's domestic production process. Historically most backward vertical FDI has been in extractive industries (e.g. oil extraction). A second form of vertical FDI is forward vertical FDI in which an industry abroad sells the outputs of a firm's domestic production process. Horizontal FDI produce the same product in multiple plants, and service local markets through affiliate production rather than through exports from the home country of the MNE. This kind of FDI is sometimes referred to as "market seeking" FDI. The FDI inflows



to developed countries are usually horizontal investments driven by market seeking strategies and they tend to increase the labor intensity of the home country domestic production (Mariotti, Mutinelli and Piscitello, L., 2003). Horizontal investments replicate the complete production process of the home country in a foreign country. The horizontal FDI seeks to take advantages of a new large market, which is considered as traditional motive for the FDI (Botric and Skulic, 2005).

Buckley and Casson (1976) conceptualized the internalization theory. In the international business literature, the market imperfections approach to FDI is typically referred to as internalization theory. Market imperfections created the opportunity to internalize transactions within a firm. Instead of conducting business externally between two firms- in separate countries, it made sense to instead maximize profits by doing business internally across national boundaries. Two things are essential at this point, firstly firms would choose the least cost location and secondly firms would internalize until the cost outweighed the benefits. Nonetheless, in reality, cost is not the only crucial factor of success since companies must also consider other factors such as cultural, regulatory and other environmental factors (Jigme, 2006).

Another existing theoretical development analyzing the origin and form of internationalization is based on the product life cycle (Vernon, 1966). This theory was initially proposed by Raymond Vernon in the mid 1960s. Vernon argued that often the same firms that pioneer a product in their home markets undertake FDI to produce a product for consumption in foreign markets. The PLC Theory suggests that firms go through different stages in the development of their output. Products pass through an introductory phase, followed by growth, maturity and then decline phases. The length of time, during which a product remains in certain stages, is a function of a variety of factors. Vernon's view is that companies undertake foreign direct investment at particular stages in the life cycle of a product they have pioneered. Many companies launch old products in new markets. They invest in other advanced countries when local demand in those countries grows large enough to support local production. As a result in the early stage FDI is local market oriented. They subsequently shift production to developing countries when product standardization and market saturation give rise to price competition and cost pressures. Investment in developing countries, where labor costs are lower is seen as the best way to reduce costs. Thus, FDI in the latter phase of the product cycle will be export oriented, motivated

predominantly by cheap labor considerations. In the decline stage of PLC, the product innovating country becomes the net importer of the products. (Jigme, 2006).

Knickerbocker (1973) introduced “oligopolistic reaction” to explain why firms follow rivals into foreign markets. According to the theory FDI flows are a reflection of strategic rivalry between firms in the global marketplace. In oligopolistic industries there is an interdependence of the major players, i.e. what one firms have had an immediate impact on the major competitors. Similarly, in FDI there is an imitative behavior, i.e. if an oligopolistic firm expands to a certain market, most likely its competitors will knock out their export business to the same competitive asset.

Meyer (1995) introduced structural change FDI as another development approach to FDI. Companies in business that are endangered by a loss of competitiveness are faced with the need to restructure due to the cost pressure. Moving into production facilities overseas is one potential way of restructuring. This way, companies continue to develop their existing industry specific assets, but switch the expensive home country's labor force with the cheaper one in the host country (Meyer, Klaus E., 1995). Structural change FDI is centered on factor cost differentials i.e. around export-oriented FDI as stated earlier.

Under neo classical growth theories capital accumulation was seems as important driving factors towards steady state level of economic growth. Technological progress, capital and labor productivity was the main forces for economic growth .The efficiency of these factors increase total productivity function through higher investment in economy. In this model, FDI seems to improve technological progress. Furthermore, due to increase higher investment thereby increases productivity level and per capita income. However, under neo classical growth theory, total factor productivity which is highly affected by FDI determined by the external factors. From this fact, could not guarantee long run steady state impact (Hsiao and Hsiao, 2006). On top of that, this model failed to interact economic growth with advantage of foreign technologies from developed countries that are introduced through FDI (Yao and Wei, 2007).

In addition to that, in late 1970s neo classical economic theories of FDI came to support the idea of positive relationship between FDI and economic growth. This neo classical theory of FDI has shown a way in which FDI can operate. Kojima (1975)

argued that, transfer of capital is not only influenced with the marginal productivity, but it is influenced with the differences in technology gaps. Thus FDI rise from low technology to higher technology areas.

Kindleberger (1965) defines foreign investment as balance of payments accountants defined as direct foreign investment as any flow of lending to, or purchase of ownership in a foreign enterprise that is largely owned by residents of the investing country.

FDI is considered less prone to crisis because direct investors, typically, have a longer-term perspective when engaging in a host country. In addition to the risk-sharing properties of FDI, it is widely believed that FDI provides a stronger stimulus to economic growth in host countries than other types of capital inflows. The underlying argument is that FDI is more than just capital, as it offers access to internationally available technologies and management know-how (The Economist 2001).

According to UN (2002), private international capital flows particularly foreign direct investment is vital complements to national and international development efforts. Foreign direct investment contributes toward financing sustained economic growth over the long term. It is especially important for its potential to transfer knowledge and technology, create jobs, boost overall productivity, enhance competitiveness and entrepreneurship and ultimately eradicate poverty through economic growth and development. In a similar vein, the OECD (2002) reckons that increasingly, FDI has been recognized as a powerful engine and a major catalyst for achieving development, poverty- reducing growth and global integration process.

The favorable perception of FDI contrasts remarkably with the formerly skeptical, if not hostile attitude, which prevailed also in UN organizations towards the activities of multinational corporations in developing countries. However, it would not be for the first time if a backlash occurred and multinational corporations were again, as in the 1970s, denounced as big, irresponsible, monopolistic monsters (The economist, 2001).

According to the Balance of payment manuals (IMF, 1977), foreign investment refers to investment made to acquire lasting interest in enterprises. Further, in case of FDI, the investors' purpose is to gain as effective voice in the management of the

enterprise. The benchmark definition of the organization for Economic Co-operation and Development (Paris 1983) is that direct investment enterprise as an incorporated or unincorporated enterprise in which a single foreign investor either owns 10 % or more of the ordinary shares or voting power of an enterprise (unless it can be proved that 10 % ownership does not allow the investor an effective voice in the management) or owns less than 10 % of the ordinary shares or voting power of an enterprises, yet still maintains an effective voice in management. An effective voice in management only implies that direct investors are able to influence the management of enterprises and does not imply that they have absolute control. The most important characteristics of FDI which distinguishes it from portfolio investment, is that it is undertaken with the intention of exercising control over the enterprises.

## **2.2 Empirical Studies**

Empirical context of the literature review shows the pre-developed study of the related research papers, books, reports, bulletins etc. which are related to the own research topic. It may be from domestic land and or from overseas. So that for the more precision empirical study is divided under two sub- heading, one is international context and another is national or Nepalese context.

### **2.2.1 International Context**

Despite a huge number of studies on FDI and its impact on the economic growth of the host countries, the empirical findings still provide an unclear picture of this relationship. There are however, some general conclusions regarding this relationship. In the most literature FDI is generally accepted as a vehicle for sustainable growth via its positive spillover effects, such as job creation, transfer of skills and technology, increasing competition and enhancing human capital in the host country.

Albert Hirschman (1958) emphasized that not all sectors have the same potential to absorb foreign technology or to create linkages with the rest of the economy. He noted, for example, that linkages are weak in agriculture and mining. He warned that in the absence of linkages, foreign investments could have limited effect in spurring growth in an economy. The grudge against what has become known as the ‘enclave’ type of development is due to this ability of primary products from mines, wells, and

plantations to slip out of a country without leaving much of a trace in the rest of the economy.

About the consequences in potential linkages effects differences in manufacturing and agriculture, Hirschman (1958) further added that the absence of direct linkage effects of primary production lends these views (enclaves) a plausibility that they do not have in the case of foreign investment in manufacturing.

Ramer (1993) emphasized FDI's role in diffusing technology and its relationship to economic growth. He explains that for the poorest developing nations, letting multinational firms profit from the international transmission of ideas is the quickest and most reliable way to reduce the idea gaps that keep them poor.

Foreign Direct Investment (FDI) plays a catalytic role in economic growth. It is a source of capital formation. Likewise, it helps technology to spillover, supports human capital formation, enhances international trade integration, creates competitive environment and strengthens enterprise development. There are three common motives of foreign direct investment: resource-seeking, market seeking and efficiency-seeking (Dunning, 1993).

Lipsey (2002) takes a more favorable view from reviewing the micro literature and argues that there is evidence of positive effects. Surveying the macro empirical research led Lipsey to conclude, however, that there is no consistent relation between the size of inward FDI stocks or flows relative to GDP and growth. The researcher further argues that there is need for more consideration of the different circumstances that obstruct or promote spillovers.

Unfortunately, the impact of FDI on growth remains more contentious in empirical than in theoretical studies. While some studies observe a positive impact of FDI in economic growth, other detects a negative relationship between these two variables. The controversy has arisen partially due to data insufficiency in either cross country and time series investigation. Durham (2004) fails to identify a positive relationship between FDI and Economic growth, instead suggest that effects of FDI are contingent on the "absorptive capability of host countries.

Choe (2003) attempts to show causal relationships between economic growth and FDI and GDI in 80 countries over the period 1971-95, by using a panel VAR model.

The results show that economic growth and foreign direct investment runs in either direction but with a tendency towards growth causing FDI; there is little evidence that FDI causes host country growth.

Attrayee and Hendrik (2006) examines whether FDI inflows have stimulated growth of the U.S economy. The researchers applied time series data to a simultaneous-equation model (SEM) that explicitly captures the bi-directional relationship between FDI and U.S. economic growth. FDI is found to have a significant, positive and economically important impact on U.S. growth. Also, SEM estimates reveal that FDI growth is income elastic. These result imply that: i) even a technologically advanced country such as U.S. benefits from FDI, ii) the gains from FDI are very substantial in the long run, and iii) the sustainability of the U.S. current account deficit is enhanced by FDI's positive effect on productivity but undermined by the income inelasticity of FDI. Overall the results suggest that U.S. policies should focus on keeping the country attractive to foreigner investors.

Falki (2009) conduct an exploration to break down the impact of FDI on monetary development. The information cover the period 1980-2006 on FDI, Gross domestic product, exchange, work power and capital venture uses. The conclusion is that FDI does not indicate much commitment to financial development in Pakistan for above period as contrasted and local capital and work. This study demonstrates a negative and inconsequential connection in the middle of FDI and GDP.

Wijeweera, Villano and Dollery (2010) researched the relationship in the between of FDI and the rate of development of GDP utilizing a stochastic frontier model and utilizing board information covering 45 nations over the period 1997 to 2004. They found that FDI inflows applied a positive effect on financial development just in vicinity of a very talented work power; defilement has a negative effect on monetary development; and exchange openness expanded financial development by method for productivity picks up.

Theoretically, Xolani (2011) uses panel data from developed as well as developing countries. The researcher argued that inward FDI has a positive impact on economic growth of a host country through increased capital accumulation, access to superior technology, greater efficiency, increased competitiveness and exports. The researcher

noted that the extent to which inward FDI positively impacts on growth depends on the quality of economic environment.

Jayachandran (2012) investigated the relationship among Trade, Foreign Direct Investment and GDP for Singapore during 1970-2010. This study commonly reveals a positive relationship among the Trade, FDI and economic growth. This analysis focused on Singapore, where growth of exports has been noteworthy from co integration analysis, researcher went for the opinion that there is a long run consistent relationship. The granger causality test was applied in the analysis and it manifested the causal relationship between the analyzed variables.

Atif (2012) analyses the effect of export, import and FDI on GDP. This study has examined the determinants of economic growth for the period 1980-2009 in case of Pakistan. As a representative of economic growth, the GDP growth rate has been used as dependent variable. The coefficients of all other four statistically significant coefficients are positive as they were expected. The impact of FDI on economic growth is less or not statistically significant. Positive and significant impact of exports on economic growth suggested that Pakistan should focus on export-led growth.

Naseer (2013) examines the relationship between FDI, exchange rate and economic growth of Pakistan. The study is made on time period 1980-2012. The regression is applied by taking export as dependent variable while GDP, FDI, and real exchange rate as independent variables. The unit root test, lag order selection Schwartz test, Johansen co integration test and Granger causality test is applied. He concludes that foreign income, FDI, GDP and real effective exchange rate are significantly affect trade.

Tshepo (2014) study the relation among FDI, GDP growth rate and employment by using unit root test, Johansen co integration test and found that there was a positive relationship between the variables. FDI and economic growth nexus has spurred volumes of empirical studies on both developed and developing countries. This nexus has been studied by explaining the determinants of both growth and FDI, the role of transnational companies (TNCs) in host countries, and the direction of causality between the two variables. In the other words, not only FDI can Granger cause GDP

growth (with either positive or negative impact), but GDP growth can also affect the inflow of FDI or there could be no casual link.

### **2.2.2 Nepalese Context**

An initial study has been taken by Chitrakar (1986) conducted a study on Foreign Investment in Nepal. The objectives of the study were to find the extent of foreign investment on Nepal, policies and incentives introduced to foreign investment in Nepal and investment strategies of multinational meeting held in 1982. The researcher found that the flow of foreign investment in manufacturing sector was not so enough in mineral based sector was negligible. The main problem was due to the non-implementation of policies and the act made by HMG/N, Bureaucratic Harassment, hard to get incentives according to the provision made by government etc. The impact of solitary Ministerial Meeting and Investment Promotion Meeting held for promoting foreign investment in Nepal has become less effective that fail to motivate foreign investors towards Nepal.

Bhatt (1993) found that the most critical problems of foreign investment promotion in Nepal as perceived by the responding foreign collaborators are underdeveloped infrastructure, lack of skilled and trained human resources, small domestic market and country's land locked position. The objectives of the study are: to examine and analyze the nature and extent of foreign investment in Nepal; to examine existing policies and incentives relating to FDI in Nepal and to examine the impact of foreign investment in economic development of the country. The methodology adopted in the study is both descriptive and analytical in nature. According to the study, Nepal can get benefit by improving in her physical infrastructure. At the same time, it should evaluate her educational and vocational training policies in collaboration with local and foreigner firms to make sure that adequate training programs are designed to meet industry's current and future labor requirements.

Timilsina and Mahato (1998) explain that the foreign direct investment is a means of industrialization which would lead to diversify the economy for a durable, social, psychological and institutional framework. According to the study foreign investment is considered important for the industrialization of Nepal. Some basic features associated with the direct foreign investment are that it will attract capital,



technology, and expertise furthermore it will help to share risks, exploit resources presently and provide access to export market, all these factors are either in short supply or absent in Nepal. The researchers take industrialization as a means of breaking the vicious circle of poverty thereby raising the formation and accumulation of capital in capital scarce countries like Nepal where industrial development is considered necessary for the purpose of achieving various economic goals like higher rate of growth, fulfillment of the basic needs, creation of more employment opportunities etc. They mean that industrialization is to break vicious circle of poverty and create prosperity through the process.

Bista (2005) has mentioned some conditions of FDI in Nepal and they are: i) Most investments in Nepal are small and most investors are individual than companies as such. Most of those consulted by UNCTAD were however corporate investors. ii) Some 40% of the FDI in Nepal are Indian. This is of course, to be expected, given the open border between India and Nepal and the historic links between the two countries. iii) That the insecurity created by the Maoist insurgency is not a greater concern to the private sector than it appears, is a further fact worth noting. The past trends show that the larger volume of FDI has been concentrated to Kathmandu valley which has been relatively unaffected by the insurgency.

Dangal (2002) study the nature and extent of FDI in Nepal and observed the laws and policies and other general determinants of FDI including motivating factors affecting decision to invest in Nepal, problems and prospects of FDI in Nepal. The study supported by both primary and secondary sources revealed foreign investment scenario in Nepal has been dismal. Despite it's free market reforms and incentives, Nepal has attracted only a small portion of FDI flowing to South Asia. The analysis of flow of FDI in the country reveals that it commenced to flow remarkably into Nepal from the time when democratically elected first government of Nepali Congress adopted liberal policies in the matter of getting private domestic or foreign investors involved into the economic activities of a country.

Sharma (2003) studies the Foreign Investment in Nepal and its impacts on the National Economy with the objectives to understand the problem of foreign investment Titration in Nepal and the policy improvement made by the government overtime to attract foreign investment. The study has interpreted the available data in

terms of year- wise trend, sector-wise trend, category- wise trend, plan-wise trend, country wise trend status-wise trend and the trend with reference to the scale of investment. The researcher conclusion was; the inflow of foreign capital in the form of foreign investment shows an improvement in the period after B.S. 2046 compared to the period before that. Government has made some essential provisions that are considered essential by the international community. The government also signed an agreement of avoidance of double taxation and the protection of fiscal evasive with respect to taxes in income. The changes in the trade sector performance after the inflow of foreign investment reflects adequate indication for optimism as well as pessimism. Drastic shift in the concentration of trade from India to other countries, growing export rates, decreasing share of primary and capital goods accompanied by increasing share of manufactured goods in exports, are the reasons for optimism. The study has also mentioned some problems in attracting FDI like lack of predictable and transparent policy, absence of monitoring mechanism to accurately monitor the flow of FDI, political instability, and so on.

Basnet (2003) carried out a dissertation with the major objectives of examining the overall structure of FDI in Nepal to analyze foreign financial collaboration in Nepalese industries and to find out the problems and constraints of FDI in Nepal. The researcher found that, in Nepalese economy FDI has played very crucial role, approximately 14% of the total budget of 96.1 billion was contributed in the given FY 2059/60. He used both primary and secondary data in order to fulfill the above objectives.

Dahal and Aryal (2002) analyze the Foreign Direct Investment in Nepal with special references to Indian joint ventures and write: In a poverty-stricken economy like Nepal where internal resources are extremely limited, not enough to supplement current expenditures, and dependence of foreign aid (grants and loans) is increasing with poor performance shown by economic growth rate; and where political conflict is getting momentum, the role of FDI is crucial not only to sustain development activities but also for poverty alleviation. The data for FDI reflects that investment from India is prominent, attributing to both economic and social proximity between Nepal and India. A pragmatic strategy for development based on two pillars would help achieve the target of attaining a high level of growth and poverty alleviation. These are (a) improving the investment climate though strengthening macroeconomic

stability, trade openness and competitive markets, improving governance and institutions and infrastructure and (b) through social inclusion, good governance and poverty reduction.

Subedi (2013) carried out a dissertation with the major objectives of examining the trend, structure and prospects of FDI in Nepal and found that FDI has mostly been concentrated in small scale industries in which there are 1675 total industries which is equivalent to 74.38 percent of total FDI projects, while medium and large scale industries occupy second and third position respectively. It indicates that FDI is basically directed towards small scale industries. The study also claimed that the constraining factors for foreign investment in Nepal are inadequate infrastructural base, poor state of law and order, lack of skilled and trained manpower, lack of facilitation and effectiveness of one window system, landlockedness position of the country, small market size and inconsistencies in policies.

Dangal (2015) studies the status, possibilities and challenges of FDI in Nepal and conclude that despite the growing salience of FDI, not only for traditional business-related activities but also for financing development, LDCs in general have not been able to grab this opportunity. All the South Asian countries as a whole has been receiving reasonably good amount of FDI which shows the total FDI received by the region represents a meager 2.6 percent of the global FDI inflow. Among this all, 80 percent of FDI went to India, leaving other seven countries in the region with a share of remaining just 20 percent. It is unfortunate to note that despite a recent growth in FDI achieved by Nepal, the country still receives the lowest amount of FDI in the region.

Nepal Rastra Bank (NRB) conducted the survey with an objective of identifying the position of foreign direct investment (FDI) in Nepal in 2015/16. This survey has identified the country-wise and sector-wise stock of FDI. The study found that the amount is small compared to that of neighboring countries, FDI inflow in Nepal has been increasing in recent years. FDI stock reached 6.1 percent of GDP in 2015/16, which was mainly driven by increase in reserves of FDI-based industries. Reserve constitutes two-third of FDI stock. Foreign investors from more than 39 countries have made investment in 252 firms showing great interest in the service sector which has received 70.2 percent of outstanding FDI in Nepal. Industrial sector is the second

preferred sector for FDI. However, the agriculture sector is the least preferred sector having only 0.3 percent of outstanding FDI as in mid-July 2016. Loans have a very small share (i.e. 3.7 percent) in total outstanding FDI. In terms of paid up capital, India brought the highest FDI in Nepal. However, if we consider total stock of FDI by including reserves and loans, West Indies surpasses India with FDI Stock of 62.8 billion as in mid-July 2016(NRB 2018).

### **2.3 Research Gap**

In the related studies, Hirschman (1958), Ramer (1953), Dunning (1993), Lipsey (2002), Durham (2002), Attrayee and Hendrik (2006), Falki (2009), Wijeweera, Villano and Dollery (2010), Xolani (2011), Jayachandran (2012), Atif (2012), Naseer (2013), Tsherpo (2014) were studied and reviewed for the development of this paper. Among all, Hirschman (1958) studies linkages of FDI to economic growth, Ramer (1953) found FDI as reliable source for poverty alleviation. Similarly, Dunning (1993), Lipsey (2002), Attrayee and Hendrik (2006), Wijeweera, Villano and Dollery (2010), Xolani (2011), Jayachandran (2012) and other finds the positive and significant relation between FDI and economic growth. But Durham (2002), Falki (2009) fails to identify the positive relation between them.

In Nepalese context, Chitrakar (1986), Bhatt (2005), Dangal (2002), Sharma (2003), Basnet (2003), Dahal and Aryal (2002), Subedi (20013), Dangal (2013), NRB (2018) were reviewed and studied. These papers studied the status, trend, problems and prospects of the FDI in the context of Nepal and focus only on descriptive analysis of the FDI.

In this context, this paper analyzes the trend of FDI and use ARDL method to find the relationship between foreign direct investment and GDP of Nepal. International reviews expressed the determination of this kind of study, very well. So that it is important to study the trend of FDI and establish the relationship between FDI and GDP of the country in case of Nepal also. So, this paper will be useful to reduce such gap in the study of FDI.

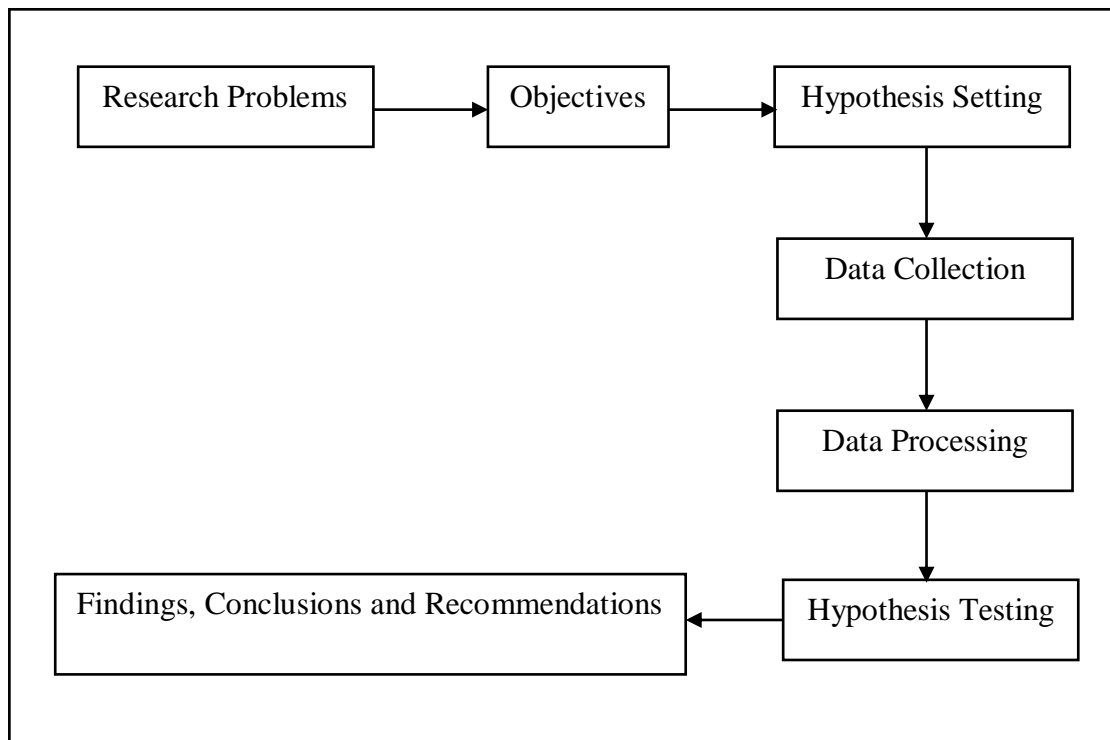
# CHAPTER - III

## RESEARCH METHODOLOGY

### 3.1 Research Design

Research design is a detail plan for how a research study is to be completed organizing variables, so they can be measured, selecting a sample of interest to study, collection data to be used as a basis for lasting hypothesis and analyzing the results so that the researcher can answer question validity, objectively, accurately and economically. The entire designing will be summarized here by following charts.

**Table 3.1: Conceptual Framework of Research Design**



Source: Author's presentation

This research is designed to examining the condition of the foreign direct investment of Nepal. For this purpose, the statement of problem is identified following with the listing of the objective of the study. Once it is done the related data are collected through the secondary source of data and information. Then the tabulation and presentation of the data and information is prepared. Through those, the required variables are taken out. Then the possible model is built up. Then the appropriate

statistical tests are performed. For that purpose, the use of appropriate Statistical software is done as per the demand of the research in coordination with the Thesis Supervisor.

### 3.2 Nature and Source of the Data

This analysis of the study attempts to get various empirical results using only secondary data, so the nature of the study has been descriptive as well as analytical. The required data has been collected mainly from various issues of economic surveys, reports, bulletins and budget speeches published by the Ministry of Finance (MoF), Central Bureau of Statistics (CBS), Economic Bulletin and the banking and financial statistics published by Nepal Rastra Bank (NRB), and other relevant organizations.

### 3.3 Description of the Variables

In the Study, two variables Real Gross Domestic Product (RGDP) and Real foreign direct investment (RFDI) are used. All the details about the description of the Variables which are used in the study are represented as bellows table:

**Table 3.2: Description of the Variables**

| <b>Variables</b>                      | <b>Explanation</b>   |
|---------------------------------------|--|
| Real Gross Domestic Product (RGDP)    | Real gross domestic product is the value of all goods and services produced in a country at constant price in one year. It is calculated by following formula:<br>$RGDP = (\text{nominal GDP}/\text{Deflator}) * 100.$ |
| Real Foreign Direct Investment (RFDI) | Real foreign direct investment is the real investment made by the foreigner by establishing a new business or additional investment on existing business.<br>$RFDI = (\text{nominal FDI}/\text{Deflator}) * 100$       |

### 3.4 Model Specification

The main objective of the research is to find the relationship between real foreign direct investment and real GDP. The general model that shows the relationship between the RFDI and economic growth can be written as

$$\ln RGDP_t = \alpha_0 + \beta_1 \ln RFDI_t + \mu_t \dots \dots \dots (1)$$

Where,

$\ln RGDP$  = natural log of real gross domestic product

$\ln RFDI$  = natural log of real foreign direct investment

$\mu_t$  = stochastic disturbances term such that  $\mu_t \sim N(0, \sigma^2)$

### 3.5 Tools of Data Analysis

For the estimating of this paper, first it requires to check whether the data are stationary or not. The process of checking stationary is called unit root testing. This is the one of the most important asymptotic property of the time series data. After testing it, proper econometric models are selected for the data processing. In the study, ADF and ARDL model are used as tools of data analysis. The details of these tools are as follows:

#### 3.5.1 Unit Root Test

A stationary time series is one whose statistical properties such as mean, variance, autocorrelation, etc. are all constant over time. The important reason for trying to stationarize a time series is to be able to obtain meaningful sample statistics such as means, variances, and correlations with other variables. Such statistics are useful as descriptors of future behavior only if the series is stationary. For example, if the series is consistently increasing over time, the sample mean and variance will grow with the size of the sample, and they will always underestimate the mean and variance in future periods. And if the mean and variance of a series are not well-defined, then its correlations with other variables cannot be defined. For this reason you should be cautious about trying to extrapolate regression models fitted to non stationary data.

As a prelude to working with time series variables one must investigate whether underlying time series data is stationary or not. Failure to assess the stationary (or non-stationary) nature of the time series data may lead to spurious regression. Further, when forecasting or conducting tests for causality one can obtain results that may be miss –specified. A series  $Y_t$  is called stationary if its mean and variance over the time are constant and the covariance between two time periods is time invariant. Using mathematical notation it is expressed as following way:

$$E(Y_t) = E(Y_{t-1}) = \dots = E(Y_{t-s}) = \mu,$$

$$V(Y_t) = V(Y_{t-1}) = \dots = V(Y_{t-s}) = \sigma^2,$$

And  $Cov(Y_t, Y_{t-s}) = Cov(Y_{t-j}, Y_{t-j-s}) = \gamma_s$  [ if it is set  $s = 0$ , it is obtained that  $\gamma_0$  which is simply the variance of  $Y_t$ ]

Unit Root Test can be tested by different methods like Dickey-Fuller Test, PP, ADF Test (Bhusal, 2013). In this study ADF test has been used to check the stationary of the data.

### 3.5.1.1 ADF Test

If a simple AR(1) model is imposed when the underlying the econometric methodology, first examines the stationary properties of each time series of consideration. The present study uses Augmented Dickey-Fuller (ADF) unit root test to examine the stationary of the data series. It consists of running a regression of the first difference of the series against the series lagged once, lagged difference terms and optionally, a constant and a time trend. This can be expressed as following expression where  $\ln Y$  is taking as a variable for examine the unit root test through Augmented Dickey Fuller Method.

$$\Delta \ln Y_t = \alpha_0 + \alpha_1 t + \alpha_2 \Delta \ln Y_{t-1} + \sum_{j=1}^p \alpha_j \Delta \ln Y_{t-j} + \varepsilon_t$$

The additional lagged terms are included to ensure that the errors are uncorrelated. In this ADF procedure, the test for a unit root is conducted on the coefficient of  $\ln Y_{t-1}$  in the regression. If the coefficient is significantly different from zero, then the hypothesis that  $\ln Y_t$  contains a unit root is rejected. Rejection of the null hypothesis implies stationary. Precisely, the null hypothesis is that the variable  $\ln Y_t$  is a non-stationary series ( $H_0: \alpha_2 = 0$ ) and is rejected when  $\alpha_2$  is significantly negative ( $H_a: \alpha_2 < 0$ ). If the calculated value of ADF statistic is higher than McKinnon's critical values, then the null hypothesis ( $H_0$ ) is not rejected and the series is non-stationary or not integrated of order zero,  $I(0)$ . Alternatively, rejection of the null hypothesis implies stationary. Failure to reject the null hypothesis leads to conducting the test on the difference of the series, so further differencing is conducted until stationary is reached and the null hypothesis is rejected. If the time series (variables) are non-stationary in their levels, they can be integrated with  $I(1)$ , when their first differences are stationary (Mishra, 2011).



### 3.5.2 ARDL Model

When the variables of the time series data are stationary at both integrated at level I(0) and integrated at first difference I(1) simultaneously Pesaran et al(2001) suggest that use the Autoregressive Distributive Lag Model (ARDL). The autoregressive distributed lag co integration procedure introduced by Pesaran and Shin (1999) and Pesaran, Shin, and Smith (1997, 2001) has been used to examine the long-run relationship between the money demand and its determinants. This test has several advantages over the well-known residual-based approach proposed by Engle and Granger (1987) and the maximum likelihood-based approach proposed by Johansen and Julius (1990) and Johansen (1992). One of the important features of this test is that it is free from unit-root pre-testing and can be applied regardless of whether variables are I(0) or I(1). In addition, it does not matter whether the explanatory variables are exogenous (Pesaran& Shin, 1997). An ARDL regression model looks like this:

$$\ln\text{RGDP}_t = \alpha + \ln\text{RGDP}_{t-1} + \dots + Y_{t-i} + \beta_{1i}\ln\text{RFDI}_{t-i} + \varepsilon_t \dots \dots \dots (i)$$
 Where  $\varepsilon_t$  is a random disturbance term, autoregressive means independent variables are explained (in part) by lagged values of itself, and distributed lag component in the form of successive lags explanatory variable (Budha, 2012).

#### 3.5.2.1 Diagnostic Test

Diagnostic test of the residuals are very important test for the study of ordinary least square (OLS) method. The properties or the assumptions should be fulfilled for the accurate results (Wooldridge, 2012). When there are the large number of observations normality test should not be necessary (Gujarati, Porter, & Gunasekar, 2009). The major Diagnostic tests are as follows:

##### (i) Serial Correlation LM Test

Serial correlation is a term used in statistics to describe the relationship between observations of the same variable over specific periods of time. If a variable's serial correlation is measured to be zero, then it means there is no correlation, and each of the observations are independent of one another. It is done to check for the serial correlation. The top part of the output of Serial Correlaiton LM Test presents the test statistics and associated probability values. The statistic labeled “Obser\*R-squared” is

the LM test statistic for the null hypothesis of no serial correlation. The (effectively) five probability and below value strongly indicates the presence of serial correlation in the residuals.

$H_0$  = presence of serial correlation in the residuals

$H_A$  = absence of serial correlation in the residuals

Histogram-Normality Test displays descriptive statistics and a histogram of the standardized residuals.

## ii) Heteroscedasticity

In simple terms, heteroscedasticity is any set of data that isn't homoscedastic. More technically, it refers to data with unequal variability (scatter) across a set of second, predictor variables. When the variance of the unobserved error,  $u$ , is constant in the OLS is called Homoscedasticity. Homoscedasticity fails whenever the variance of the unobserved factors changes across different segments of the population is called heteroscedaticity. It is arises when there is the segments are determined by the different values of the explanatory variables.

Suppose that following regression model is estimated:  $y = \beta_0 + \beta_1 x + u$  and obtain from this fitted model a set of values for  $\tilde{u}$ , the residuals. Ordinary least squares constrains these so that their mean is 0 and so, given the assumption that their variance does not depend on the independent variables, an estimate of this variance can be obtained from the average of the squared values of the residuals. If the assumption is not held to be true, a simple model might be that the variance is linearly related to independent variable.

$$\tilde{u}^2 = \gamma_0 + \gamma_1 x + v$$

This is the basis of the Breusch–Pagan test. It is a chi-squared test: the test statistic is distributed  $n\chi^2$  with  $k$  degrees of freedom. If the test statistic has a p-value below an appropriate threshold (e.g.  $p < 0.05$ ) then the null hypothesis of homoscedasticity is rejected and heteroskedasticity assumed (WikiVisually).

## (iii) Normality Test

The normality is the one of the classical linear regression for residual diagnostic test. This means the residual term ( $u$ ) is normally distributed. It means mean  $E(u_i)$ ,

Variance  $E [u_i - E(u_i)]^2$  and  $Cov.(u_i, u_j)$  equals zero. This statement mathematically can be illustrated as:  $u_i \sim N(0, \sigma^2)$  (Gujarati, Porter, & Gunasekar, 2009). Normality test can be tested by Jarque- Bera test. In statistics, the Jarque–Bera test is a goodness of fit test of whether sample data have the skewness and kurtosis matching a normal distribution. The test is named after Carlos Jarque and Anil K. Bera. Jarque-Bera is a test statistic for testing whether the series is normally distributed. The test statistic measures the difference of the skewness and kurtosis of the series with those from the normal distribution.

The statistics JB has asymptotic chi-square distribution with two degree of freedom and can be used to test the null hypothesis that the data are from a normal distribution. The null hypothesis is a joint hypothesis of skewness being zero (which is the same as kurtosis of 3). As the definition of JB shows, any deviation from this increase the JB statistics (Bhusal, 2013).

The JB statistic is computed as:

$$Jarque - Bera = \frac{N}{6} [S^2 + (K - 3)^2/4]$$

Where N is the sample size, S is the sample skewness, and K is sample kurtosis. For large sample sizes, the test statistic has a chi-square distribution with two degrees of freedom (Eviwes9).

#### **(iv) Ramsey RESET Test**

RESET stands for Regression Specification Error Test and was proposed by Ramsey (1969). It helps to identify the linearity of the explanatory variables. The classical normal linear regression model is specified as:

$$Y = X\beta + \epsilon$$

Where, the disturbance vector  $\epsilon$  is presumed to follow the multivariate normal distribution  $N(0, \sigma^2 I)$ . Specification error is an omnibus term which covers any departure from the assumptions of the maintained model. Serial correlation, heteroskedasticity, or non-normality of all violate the assumption that the disturbances are distributed  $N(0, \sigma^2 I)$ . Tests for these specification errors have been described above. In contrast, RESET is a general test for the following of specification.

- Omitted variables; X does not include all relevant variables.
- Incorrect functional form; some or all of the variables in Y and X should be transformed to logs, powers, reciprocals, or in some other way.
- Correlation between X and  $\epsilon$ , which may be caused, among other things, by measurement error in X, simultaneity, or the presence of lagged Y values and serially correlated disturbances.

Under such specification errors, LS estimators will be biased and inconsistent, and conventional inference procedures will be invalidated. Ramsey (1969) showed that any or all of these specification errors produce a non-zero mean vector for  $\epsilon$ . Therefore, the null and alternative hypotheses of the RESET test are:

$$H_0: \epsilon \sim N(0, \sigma^2 I)$$

$$H_1: \epsilon \sim N(\mu, \sigma^2 I) \quad \mu \neq 0$$

### 3.5.2.2 Bound Test/ Co-Integration

Traditional methods of estimating co-integrating relationships, such as Engle-Granger (1987) or Johansen's (1991, 1995) method, or single equation methods such as Fully Modified OLS, or Dynamic OLS either require all variables to be I(1), or require prior knowledge and specification of which variables are I(0) and which are I(1). To alleviate this problem, Pesaran and Shin (1999) showed that cointegrating systems can be estimated as ARDL models, with the advantage that the variables in the co-integrating relationship can be either I(0) or I(1), without needing to pre-specify which are I(0) or I(1). Pesaran and Shin also note that unlike other methods of estimating co-integrating relationships, the ARDL representation does not require symmetry of lag lengths; each variable can have a different number of lag terms (Eviews9).

If the non-stationary time series trend to revert to a common term trend, they are said to be co-integrated. Co-integration thus, means long run relationship between variables. Using the co-integrating relationship form Pesaran, Shin and Smith (2001) describe a methodology for testing whether the ARDL model contains a level (or long-run) relationship between the independent variable and the regressors. The Bounds test view displays the output of the Bounds Test of co-integration, displaying the F-statistics and the 10%, 5%, 2.5% and 1% bounds for both the all I(0) and I(1)

cases. ). If the computed F-statistic is above the upper bound critical value than null hypothesis for no long run co-integration is rejected, if lies below the lower bound critical value then the null hypothesis for no lung run co-integration is accepted while in case lies in between upper and lower bounds then the decision will not be a clear one as it is the inconclusive region.

$H_0$  = no long run cointegration

$H_A$  = long run co-integration

### **3.5.2.3 ECM/Short Run Dynamics**

An error correction model belongs to a category of multiple time series models most commonly used for data where the underlying variables have a long-run stochastic trend, also known as counteraction. ECMs are a theoretically-driven approach useful for estimating both short-term and long-term effects of one time series on another. The term error-correction relates to the fact that last-periods deviation from a long-run equilibrium, the error, influences its short-run dynamics. Thus ECMs directly estimate the speed at which a dependent variable returns to equilibrium after a change

### **3.5.2.4 Stability Test: CUSUM and CUSUMQ**

The CUSUM test was introduced by Brown et al. (1975) for the study of structural change and the original test statistic was constructed based on cumulated sums of recursive residuals. Ploberger and Kramer (1992) extended the CUSUM test to OLS residuals. Nowadays, these tests are widely used in econometrics and statistics, and have become especially popular because they draw attention to structural change and breakpoints in the data (Xiao & Phillips, 2002). The CUSUM test (Brown, Durbin, & Evans, 1975) is based on the cumulative sum of the recursive residuals. This option plots the cumulative sum together with the 5% critical lines. The test finds parameter instability if the cumulative sum goes outside the area between the two critical lines.

# **CHAPTER- IV**

## **PRESENTATION AND ANALYSIS OF DATA**

### **4.1 Introduction**

This chapter is mainly concerned with trend of foreign direct investment (FDI) in Nepal from FY 1990/91 to 2015/16. The study of trend of the variables over the time period is very important for this paper. The study about trend and nature of the variables can be explained by following two points separately:

#### **4.1.1 Trend of Gross Domestic Product and Foreign Direct Investment**

Foreign direct investment in Nepal can be analyzed in terms of time periods as Panchayat system (Before 1990) and Multiparty system (After 1990).

##### **a) Panchayat system (Before 1990)**

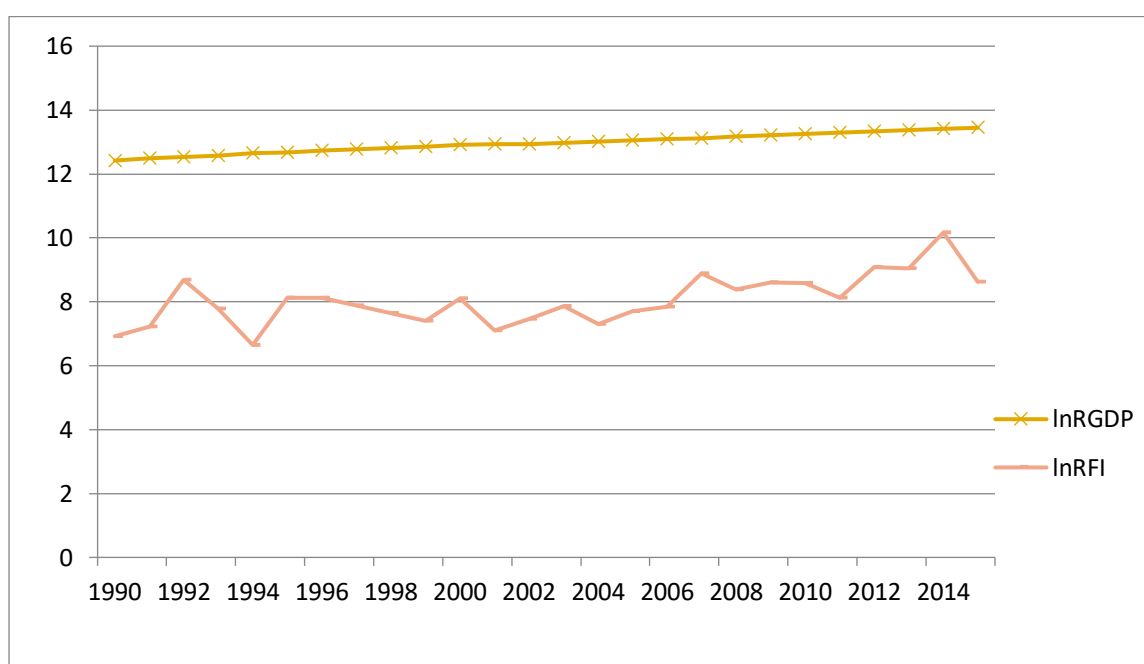
In 1960s', Panchayat regime was introduced. However, the political transition of that time could not favor FDI till 1980s. In the subsequent years of 1980s, Nepalese economy was suffering from macroeconomic crisis. In such situation, Nepal had not alternative except to implement structural adjustment program (SAP) introduced and developed by World Bank and IMF. In 1980s the government of Nepal reviewed commercial Act 1984 and then liberalized the financial sector for joint venture in commercial banks. Consequently Nepal Arab Bank Limited was established. The SAP was continued till 1989 and during this period, the flow of FDI began to come in Nepal in financial and service sector.

##### **b) Multiparty system (After 1990)**

Nepalese economy is passing through a critical phase of low level of equilibrium trap circumscribed by poverty and stagnation, and conflict and recession. FDI trend seems to be more fluctuating during the last 26 years. As political stability and peace are the sine quo non for attracting greater volume of FDI in Nepal. Nepalese economy has suffered from serious structural constraints accompanied by unprecedented political turmoil since many years. Present scenario reveals that Nepal has not been able to attract desirable size of FDI inflow within the country. Nepal Investment Forum was organized in 1992 in Kathmandu, which was a very successful in attracting the foreign investors (Department of Industry, 2005).

Thereafter, political and economic scenarios have been changed significantly. The GoN organized Nepal Investment Summit on 2-3 March, 2017. This summit observed the USD 13.74 billion investment commitment to ten sectors from 26 companies of eight countries.

**Fig.4.1 Trend of GDP and FDI after 1990**



Source: Department of Industry

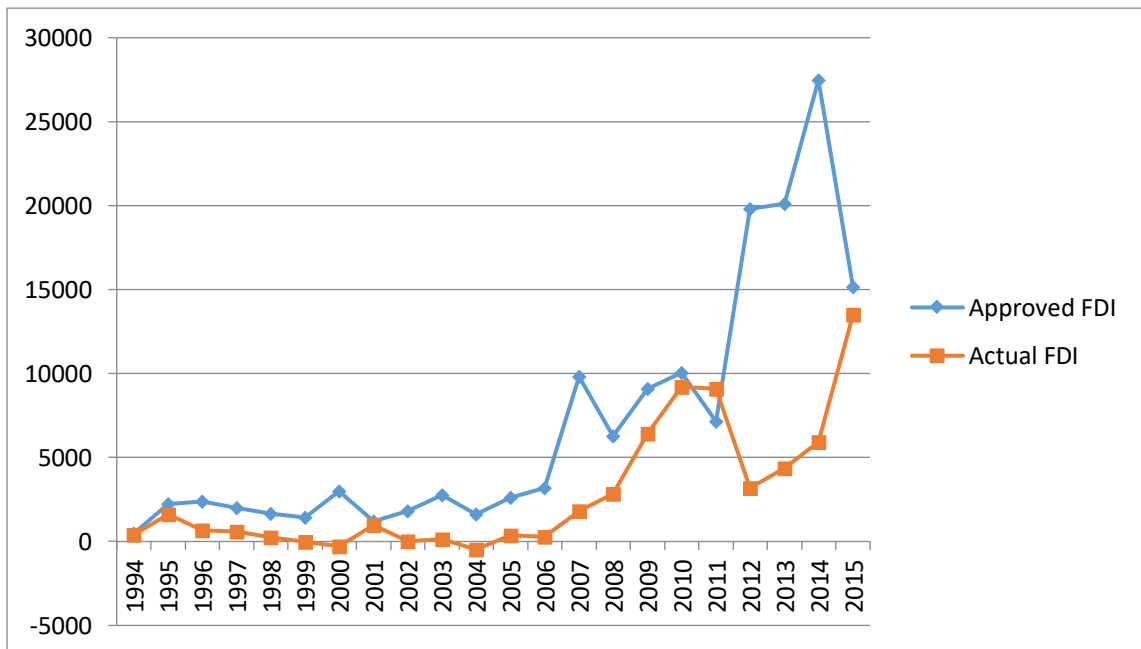
In the above graph, it is seen that real gross domestic product increases continuously during study period but foreign direct investment is fluctuating. Foreign direct investment was confined to Rs. 5551.753 million in 2015/16. During the last 26 years between 1990/91 to 2015/16, trends in RFDI were found to be erratic and jumping. The RFDI jumps from Rs 1008.139 million in 1990/91 to Rs. 5896.119 million in 1992/93 due to the establishment of the democracy in the country. Foreign investors are attracted with the hope of further open up the economy with more liberal policy. But due to unstable government, it declined the next two consecutive years. And then in 1995/96, it started to increase and this trend lasted only for two years. Again RFDI continued to decline for three consecutive periods between 1997/98 to 1999/2000 due

to the unstable government and internal conflict arises in the country. After 2000/2001, RFDI continue to fluctuate reaching all time high Rs 26033.97 million in the year 2014/15. Again it falls to Rs 5551.753 million in next year 2015/16. The fluctuating foreign direct investment are most serious problem in this regard is the skewed distribution of roads, the communication network highly concentrated in a few towns and cities and the meagre supply power for industrial use. One major challenge is the situation where foreign investment friendly environment has not been created. The development of entrepreneurship, use of advanced technology, and promotion of technical capacity have to be encouraged in order to reap benefits and face challenges emerging after the WTO membership and the SAPTA, SAFTA and BIMSTEC agreements.

#### 4.1.2 Status of Approved FDI and Actual FDI

Department of Industry (DOI) gives the permission to establish FDI industries. But, there is a time lag between approved and actual investment. The actual investment may not take place at all. NRB has statistics on actual or net FDI. The FDI presented in BoP is net change in FDI liability in a year.

**Fig.4.2 Approved FDI and Actual FDI**



Source: Approved FDI from Department of Industry and Actual FDI from NRB



The statistics on approved FDI shows small amount of FDI prior to 2007/08. Thereafter, significant improvement has been observed in FDI approval. For example Rs. 67 billion FDI was approved in 2015/16. Similarly, the pace of actual FDI inflow was slow till 2007/08. However, it accelerated after the end of decade long conflict and the onset of peace process in 2008. The net FDI inflow registered was of Rs. 9.2 billion in 2011/12. The FDI recorded during the 2000/01, 2001/02 and 2005/06 reflects the net outflows.

## 4.2 Empirical Analysis of RFDI and RGDP

Empirical analysis is an evidence-based approach to the study and interpretation of information. The empirical approach relies on real world data, metrics and results rather than theories and concepts. In this heading, empirical analysis of impact of RFDI on RGDP is done on following way:

### 4.2.1 Statistical Analysis

Before going to the time series econometric analysis, a detailed statistical analysis is carried out. Our complete data set consists of twenty six years of annual observations from Fiscal Year 1990/91 to Fiscal Year 2015/16.

**Table 4.1: Statistical Analysis**

|              | Real GDP | Real Foreign Direct investment |
|--------------|----------|--------------------------------|
| Mean         | 443205.5 | 4394.822                       |
| Median       | 421895.5 | 2975.067                       |
| Maximum      | 689848.0 | 26033.97                       |
| Minimum      | 247493.0 | 770.3065                       |
| Std. Dev.    | 130570.3 | 4954.727                       |
| Skewness     | 0.318860 | 0.371459                       |
| Kurtosis     | 2.049449 | 15.23940                       |
| Jarque-Bera  | 1.419419 | 211.5424                       |
| Probability  | 0.491787 | 0.0000                         |
| Observations | 26       | 26                             |

Source: Author's Calculation through E-views

The descriptive statistics are shown in table 4.1 exhibits that the average of Real GDP is Rs. 443205.5 million with standard deviation of 130570.3. Similarly mean of FDI is 4394.822 million with standard deviation 2975.06. Both the variables (Real GDP and Real Foreign Direct Investment) are moderately skewed (symmetric) as the skewness value for both variables is below 0.5. Kurtosis statistics of both variables are leptokurtic (higher peak) relative to the normal. A Jarque-Bera test shows that the residual of Real GDP is normally distributed except the Real Foreign Direct Investment which shows the not normal distribution. The total numbers of observations of the variables are 26.

### 4.3. Short run and long run association between RGDP and RFDI

#### 4.3.1 Augmented Dickey Fuller Test/ Unit Root Test

As it is described in chapter third, sub point 3.6.1.1 it is tested one by one in level form and first difference. Each category further tested as intercept and another form is intercept and trend. The study introduces the variables lnRGDP and lnRFDI checked one by one with the null and alternative hypothesis as follows example:

$H_0$  = the variable lnRGDP has unit root/ the variable lnRGDP is not stationary.

$H_1$  = the variable lnRGDP has not unit root/ the variable lnRGDP is stationary and so on.

**Table 4.2 Augmented Dickey Fuller Test**

| Variable | Level                  |                       | First difference    |                      | Remarks |
|----------|------------------------|-----------------------|---------------------|----------------------|---------|
|          | Intercept              | Trend and intercept   | Intercept           | Trend and intercept  |         |
| lnRGDP   | -1.4906<br>(0.5217)    | -2.7628<br>(0.2225)   | -5.229*<br>(0.0003) | -5.2812*<br>(0.0014) | I(1)    |
| lnRFDI   | -3.02623**<br>(0.0461) | -4.2016**<br>(0.0145) | -7.107<br>(0.00)    | -6.9002<br>(0.00)    | I(0)    |

Source: author's calculation

\*and \*\* denotes the 1% and 5% level of significance.

The test applied Augmented Dickey-Fuller test. If each of the variables are found significant at their level then that variables are known as I (0) which means that it's

means and variance are constant over time and the value of the covariance between the two-time period depends only on the distance or gap or lag between the two-time periods and not the actual time at which the covariance is computed. The test suggest that lnRGDP is integrated of order one I(1) which means it is found to be stationary at first difference. While the lnRFDI is stationary at level I(0). Based on these findings the ARDL/Bound test for co-integration is best suited for analysis.

#### 4.3.2 Autoregressive Distributed Lag (ARDL) Model to Co-integration:

The long run co-integration decision is made through Wald-F statistics. In this approach, we compare our F value with lower and upper bound critical values calculated by Pesaran et al. (2005). If the computed F-statistic is above the upper bound critical value than null hypothesis for no long run co-integration is rejected, if lies below the lower bound critical value then the null hypothesis for no long run co-integration is accepted while in case lies in between upper and lower bounds then the decision will not be a clear one as it is the inconclusive region. The bound test for co-integration is done in the table 4.3 below to examine the long run co-integration.

**Table 4.3: Estimation of Bounds Test for ARDL (3,1) Co integration Model**

| Test Statistic | Value   | Significance | I(0) | I(1) |
|----------------|---------|--------------|------|------|
| F-statistic    | 6.42257 | 10%          | 3.02 | 3.51 |
| K              | 1       | 5%           | 3.62 | 4.16 |
|                |         | 2.5%         | 4.18 | 4.79 |
|                |         | 1%           | 4.94 | 5.58 |

Source: Author's Calculation through E-views

The results present in above table shows that calculated F-statistic (6.42257) exceeds the upper bound of the tabulated value of F-statistics at 1%, 2.5%, 5% and 10% levels of significance, which reject the null hypothesis that there is no long run relationship among the variables. And thus, there exist long run co-integration as suggested by Pesaran and Shin (2001).The non-stationary time series trend to revert to a common term trend, they are said to be co-integrated.

To estimate the ARDL equation lag length of each variable must be identified. This research work prefers the Eviews software default lag length selection criterion for

this purpose. Eviews has selected the lag length (3,1) and applied on the ARDL model and ECM model. The software has selected the lag length (3,1) which explains that Real GDP are regressed with three lag and Real RFDI is regressed with one lag.

#### **4.3.2.1 Long-run Equilibrium**

After establishing the long run co-integration among the series, in next step we explore long run impacts of foreign direct investment on economic development. The results are displayed below by figure 4.4.

$$\ln\text{RGDP}_t = 11.39018 + 0.3521*\text{RFDI}_t$$

**Table 4.4: Long-Run Coefficients of ARDL (3,1)****Model Dependent Variable ln(RGDP)**

| Regressor | Coefficient | Standard Error | t-ratio | Prob.   |
|-----------|-------------|----------------|---------|---------|
| Constant  | 11.39018    | 0.097965       | 3.5949  | 0.0000* |
| lnRFDI    | 0.35        | 0.097965       | 3.5949  | 0.0022* |

Source: Author's Calculation through E-views

Note: \* show significance level at 1 percent.

The above table is indicating long run result of ARDL model. Finding confirms that there is a positive and significant relationship between Real GDP and Real RFDI at 1% level of significance. It indicates that if we increase 1 percent in Real Foreign Direct Investment variable, in the response there will be an increase in Real GDP by 0.35 %. This means if we increase the Real Foreign Direct Investment by Rs. 1 million amounts, there will be increase in the Real GDP by Rs. 350 thousands.

**4.3.2.2 Short Run Dynamics**

After estimating long run coefficients, the final step in ARDL approach is the analysis of Error correction and estimation of short run coefficients. According to the relevant theory if there is co-integration among the variables then in the short-run error correction will also happen. The results of Error Correction Model are summarized in Table 4.5.

**Table 4.5: Error Correction Representation of the Selected ARDL (3,1) Model****Dependent Variable  $\Delta \ln \text{RGDP}$** 

| Variables                    | Coefficient | Std. Error | t-Statistic | Prob.   |
|------------------------------|-------------|------------|-------------|---------|
| $\Delta \ln \text{RGDP}(-1)$ | -0.2942     | 0.2084     | -1.41150    | 0.1761  |
| $\Delta \ln \text{RGDP}(-2)$ | -0.3005     | 0.2200     | -1.36614    | 0.1892  |
| $\Delta \ln \text{RFDI}$     | 0.00901     | 0.0043     | 2.0787      | 0.0531  |
| ECT (-1)                     | -0.0507     | 0.0109     | -4.6405     | 0.0000* |

$R^2 = 0.27$     $R^2_{adj.} = 0.15$    S.E. 0.014   DW= 2.1   AIC = -5.515

Source: Author's Calculation through E-views

\*Shows significant at 1% level of significance

According to the results given in the table above, the existence of a stable long-run relationship among the variable is further confirmed by the significant error correction term. The coefficient of the error correction term also represents the speed of adjustment. That is following a disturbance in the unrestricted model how quickly the variables returned backs to their long-run values. The results suggest that following a shock, approximately the coefficient of error correction term (-0.0507) is significant at one percent level. Highly significant negative sign of the error correction term reinforces the existence of long-run relationship among the variables. The coefficient of  $ECT_{-1} = -0.0507$  imply that deviation from the long-term is corrected by 5.07% by the following year.

#### 4.2.2.3 Diagnostic Test

Residual diagnostic test provides tests for serial correlation; normality, heteroskedasticity, and autoregressive conditional heteroskedasticity in the residuals from our estimated equation.

**Table 4.6: Diagnostic Test**

| <b>Diagnostic Tests</b>                | <b>FDI Model</b>            |
|--|-----------------------------|
| R- squared                             | 0.997                       |
| Adjusted R-squared                     | 0.997                       |
| F- statistics                          | 1294.600(p value=0.000)     |
| AIC(least among 20 model)              | -5.341                      |
| D-W test                               | 2.10                        |
| $\chi^2$ (Autocorrelation)             | 3.87(p-value=0.1440; lag=2) |
| $\chi^2$ (Normality)/JB test           | 0.0278( p value =0.9861)    |
| $\chi^2$ (Heteroscedasticity) /BP test | 7.02( p value = 0.2188)     |
| $\chi^2$ (Functional Form/RESET Test)  | 0.243(p-value=0.6285;lag=1) |

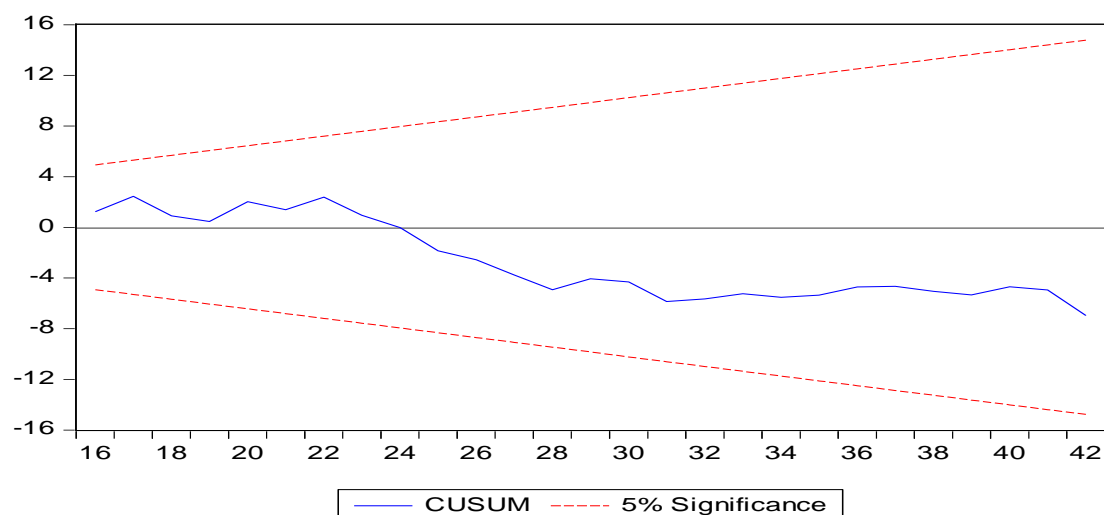
Source: Appendices D, E, F and G

The above both model's diagnostic result shows that overall the model is good. In the given ARDL model is overall good because the F statistics is statically significant at the less than 1 percent of significance level. R squared and adjusted R Square are both 99 percent respectively. Among the 20 models estimated by eviews, minimum AIC is -5.341. According to the Pesaren et al. (2001) ARDL model should be free from the serial correlation for the further analysis of the model. According to the diagnostic test from the above table, it can be said that the models are overall good for the further processes. The Durbin-Watson test value is 2.10. D-W value near 2 shows that there is no autocorrelation in the model. Basically serial correlation LM test shows that the condition of the rejection of the null hypothesis means this model is free from serial correlation. For the normality test, JB test has been used and p-value of this test is 0.98 which rejects the null hypothesis that there is no normality. BP test also shows that there is no homoscedascity in the model. Ramsey test also shows the specification of the model is best.

#### 4.3.2.4 Stability Test (Recursive Estimates)

The cumulative sum (CUSUM) graphs and cumulative sum of squares (CUSUM of Squares) of recursive residuals show that coefficient of the short run lies within the critical limits and indicates stability in the coefficients over the sample period. It is shown by figure 4.3 and figure 4.4.

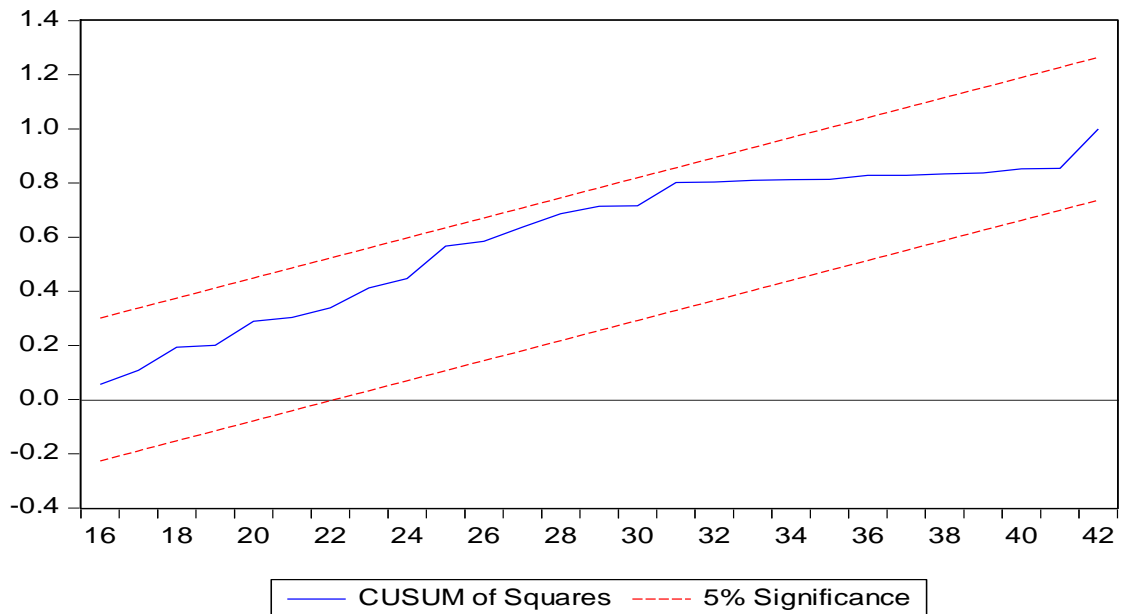
**Figure 4.3: Plot of cumulative sum of recursive residuals**



Source: Author's Calculation through E-views

Since, the plots of CUSUM statistic for Real GDP are within the critical lines at the 5% significance level, long run coefficient of the Real GDP function is stable. The stability of the long-run parameters together with short run movements for the estimated equations exists.

**Figure 4.4: Plot of cumulative sum of squares of recursive residuals**



Source: Author's Calculation through E-views

Since, the plots of CUSUM of square for Real GDP are within the critical lines, this shows that the specified overall model is statistically significant at the significance level of 5%.



# **CHAPTER-V**

## **SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Summary of the Findings**

The key goal of developing countries like Nepal is to attain higher economic growth rate and reduce poverty with macroeconomic stability. Nepal has made a promising start in implementing market oriented reform and promoting FDI as part of it, but it has a long way to go in reaping the benefits from the greater global integration through FDI. Foreign investment scenario in Nepal has been dismal. Despite its free market reforms and incentives, Nepal has attracted only a small portion of foreign investment flowing to south Asia.

The analysis of the flow of foreign investment in the country reveals that it commenced to flow remarkably into Nepal from the time when democratically elected first government adopted liberal policies in the matter of getting private domestic or foreign investors involved into the economic activities of a country. Before 1990, as per the official record of DOI, there was notable flow of it due to the restrictive policies imposed during the period of 1980s. The implementation of SAP and SAF paved the way for liberalizing and privatizing the economy and that contributed for increased flow of FDI up to 1994. Later on, due to the internal peace and security problem, it is found to be dwindling down.

According to the data obtained from DOI, real foreign direct investment was confined to Rs. 5551.753 million in 2015/16. During the last 26 years between 1990/91 to 2015/16, trends in RFDI were found to be erratic and jumping. The RFDI jumps from Rs 1008.139 million in 1990/91 to Rs. 5896.119 million in 1992/93, and for the next two consecutive years it declined. And then in 1995/96, it started to increase and this trend lasted only for two years. Again RFDI continued to decline for three consecutive periods between 1997/98 to 1999/2000. After 2000/2001, RFDI continue to fluctuate reaching all time high Rs 26033.97 million in the year 2014/15. Again it falls to Rs 5551.753 million in next year 2015/16.

Time series analysis shows that there exist long run relationship between RGDP and RFDI. There is significant and positive relation between them means that RFDI positively affect the RGDP in the long run. From this study, it is found that if we increase 1 percent in Real Foreign Direct Investment variable, in the response there will be an increase in Real GDP by 0.35 %. The existence of a stable long-run relationship among the variable is further confirmed by the significant error correction term. The results suggest that following a shock, approximately the coefficient of error correction term (-0.0507) is significant at one percent level. Highly significant negative sign of the error correction term reinforces the existence of long-run relationship among the variables. The coefficient of  $ECT_{-1} = -0.0507$  imply that deviation from the long-term is corrected by 5.07% by the following year

## **5.2 Conclusions**

This study aims to establish trend and nature of the real gross domestic product and real foreign direct investment in short run and long run and also explore the significance relationship among dependent and independent variables. On the basis of the above findings, main conclusions are highlighted in the following points:

- i. The trend of the real gross domestic product is going upward from 1990 to 2015, real foreign direct investment is fluctuating irregularly. As political stability and peace are the sine quo non for attracting greater volume of FDI in Nepal. Nepalese economy has suffered from serious structural constraints accompanied by unprecedented political turmoil since many years. Present scenario reveals that Nepal has not been able to attract desirable size of FDI inflow within the country. Statistics show that FDI in Nepal is relatively on small proportion compared to the South Asian countries
- ii. Positive relationship between RGDP and RFDI is found. It means that increase in RFDI helps to increase the RGDP of the country which ultimately helps to achieve higher economic growth. Developing countries like Nepal faces lower saving and lower capital formation. In this context, FDI can play vital role in the capital formation process. This increases the production and export of the country and can lead the country to a developing nation with higher GDP and higher PCI.

- iii. There is the long run association established among the variables in the above model.

### **5.3. Recommendations**

Following recommendations are made through the thesis.

- i. The impact of foreign direct investment on gross domestic product is positive, so government should focus to increase inflow of FDI which can enhance the GDP of the country. Domestic demand for the goods of the country is very high which may encourage the foreign investors.
- ii. To implement the federal system, government should generate huge amount of revenue. In this context, FDI can play vital role to fulfil government requirement through the increase in production and export of the country. At a time when the country is striving for strengthening its infant republican democratic system, political and economic agenda should go hand-in-hand. Whatever the nature or size of system the country is going to switch over to, the future state will have to ultimately deliver in economic terms to common people.
- iii. Nepalese economy hugely depends on remittance and the rate of remittance inflow gets slowed down from last year. This may pressurize the balance of payment. To compensate the decline in remittance, FDI is the best option for the country. Also country is facing low capital formation due to high consumption pattern. FDI increases the capital formation of the country which can increase the GDP of the country significantly in long run.
- iv. Nothing is possible without peace and security. There is no meaning of laws favourable to investor till there is unfavourable environment. Peace and security with political stability, end of all type of strikes can enhance the inflow of FDI in Nepal.
- v. Nepal is still lacking the basic infrastructures due to which the flow of foreign investment and other development activities are less than impressive. The most serious problem in this regard is the skewed distribution of roads, the communication network highly concentrated in a few towns and cities and the meagre supply power for industrial use.

- vi. One major challenge is the situation where foreign investment friendly environment has not been created. The development of entrepreneurship, use of advanced technology, and promotion of technical capacity have to be encouraged in order to reap benefits and face challenges emerging after the WTO membership and the SAPTA, SAFTA and BIMSTEC agreements.

## APPENDIX A

### Concerned Variables in Nominal Form, real form and log form

( in millions)

| Year | Nominal<br>GDP | GDP<br>deflator | Real<br>GDP | FDI      | Real FDI | LNRGDP  | LNRFDI |
|------|----------------|-----------------|-------------|----------|----------|---------|--------|
| 1990 | 99739          | 40.3            | 247493      | 406.28   | 1008.14  | 12.4191 | 6.92   |
| 1991 | 116140         | 44              | 263955      | 597.84   | 1358.73  | 12.4835 | 7.21   |
| 1992 | 144805         | 52.3            | 276875      | 3083.67  | 5896.12  | 12.5313 | 8.68   |
| 1993 | 165281         | 57.7            | 286449      | 1378.76  | 2389.53  | 12.5653 | 7.78   |
| 1994 | 191651         | 62              | 309115      | 477.59   | 770.31   | 12.6415 | 6.65   |
| 1995 | 209830         | 65.9            | 318407      | 2219.86  | 3368.53  | 12.6711 | 8.12   |
| 1996 | 239380         | 71.1            | 336681      | 2395.54  | 3369.25  | 12.7269 | 8.12   |
| 1997 | 269432         | 76.2            | 353586      | 2000.28  | 2625.04  | 12.7759 | 7.87   |
| 1998 | 288914         | 79.3            | 365592      | 1666.42  | 2101.41  | 12.8093 | 7.65   |
| 1999 | 329966         | 86.3            | 382348      | 1417.61  | 1642.65  | 12.8541 | 7.40   |
| 2000 | 366388         | 900.3           | 405746      | 3002.56  | 3325.09  | 12.9135 | 8.11   |
| 2001 | 413428         | 100             | 413428      | 1209.65  | 1209.65  | 12.9322 | 7.10   |
| 2002 | 430241         | 103.9           | 414092      | 1793.77  | 1726.44  | 12.9338 | 7.45   |
| 2003 | 460207         | 107.1           | 429699      | 2764.8   | 2581.51  | 12.9708 | 7.86   |
| 2004 | 499800         | 111.4           | 448654      | 1635.77  | 1468.38  | 13.014  | 7.29   |
| 2005 | 546534         | 118             | 463165      | 2606.31  | 2208.74  | 13.0458 | 7.70   |
| 2006 | 606308         | 126.2           | 480435      | 3185.98  | 2524.55  | 13.0824 | 7.83   |
| 2007 | 668403         | 135.4           | 493651      | 9812.6   | 7247.25  | 13.1096 | 8.89   |
| 2008 | 746309         | 142.9           | 522260      | 6255.09  | 4377.25  | 13.1659 | 8.38   |
| 2009 | 900259         | 165.9           | 542652      | 9100     | 5485.23  | 13.2042 | 8.61   |
| 2010 | 1072679        | 189.6           | 565759      | 10053.21 | 5302.33  | 13.2459 | 8.58   |
| 2011 | 1235165        | 210.3           | 587335      | 7138.31  | 3394.35  | 13.2834 | 8.13   |
| 2012 | 1376245        | 224.1           | 614121      | 19818.73 | 8843.70  | 13.3279 | 9.09   |
| 2013 | 1516617        | 237.8           | 637770      | 20107.42 | 8455.60  | 13.3657 | 9.04   |
| 2014 | 1747593        | 259.2           | 674226      | 67480.04 | 26033.97 | 13.4213 | 10.17  |
| 2015 | 1881215        | 272.7           | 689848      | 15139.63 | 5551.75  | 13.4442 | 8.62   |

*Source:* Various quarterly economic bulletins, NRB and economic survey

**APPENDIX B: Selection of Maximum Lag Length by using the  
AIC and BIC Criterion for the Equation (3.12.1)**

Model Selection Criteria Table  
 Dependent Variable: LNRGDP  
 Date: 07/26/18 Time: 09:34  
 Sample: 1990 2015  
 Included observations: 23

| Model | LogL          | AIC*        | BIC         | HQ          | Adj. R-sq   | Specification |
|-------|---------------|-------------|-------------|-------------|-------------|---------------|
| 9     | 66.6437087... | -5.51306... | -5.21550... | -5.44296... | 0.996821... | ARDL(3, 1)    |
| 14    | 65.5532055... | -5.50483... | -5.25687... | -5.44642... | 0.996697... | ARDL(2, 1)    |
| 8     | 67.5398480... | -5.50362... | -5.15647... | -5.42184... | 0.996875... | ARDL(3, 2)    |
| 19    | 64.4869211... | -5.49881... | -5.30043... | -5.45208... | 0.996563... | ARDL(1, 1)    |
| 13    | 66.1896756... | -5.47178... | -5.17423... | -5.40169... | 0.996687... | ARDL(2, 2)    |
| 3     | 68.1506113... | -5.46823... | -5.07149... | -5.37477... | 0.996832... | ARDL(4, 2)    |
| 4     | 66.7346594... | -5.43042... | -5.08327... | -5.34864... | 0.996637... | ARDL(4, 1)    |
| 18    | 64.6123381... | -5.41930... | -5.17133... | -5.36089... | 0.996402... | ARDL(1, 2)    |
| 7     | 67.5549936... | -5.41409... | -5.01734... | -5.32062... | 0.996656... | ARDL(3, 3)    |
| 1     | 69.4535443... | -5.40486... | -4.90893... | -5.28804... | 0.996717... | ARDL(4, 4)    |
| 20    | 62.3639159... | -5.39671... | -5.24794... | -5.36167... | 0.996050... | ARDL(1, 0)    |
| 12    | 66.2889010... | -5.38990... | -5.04275... | -5.30812... | 0.996498... | ARDL(2, 3)    |
| 2     | 68.2320662... | -5.38473... | -4.93839... | -5.27959... | 0.996614... | ARDL(4, 3)    |
| 6     | 67.9025212... | -5.35477... | -4.90843... | -5.24963... | 0.996511... | ARDL(3, 4)    |
| 17    | 64.8850691... | -5.35318... | -5.05563... | -5.28309... | 0.996270... | ARDL(1, 3)    |
| 15    | 62.7975108... | -5.34522... | -5.14685... | -5.29849... | 0.995992... | ARDL(2, 0)    |
| 11    | 66.4708323... | -5.31553... | -4.91878... | -5.22206... | 0.996310... | ARDL(2, 4)    |
| 16    | 65.0240167... | -5.27491... | -4.92776... | -5.19313... | 0.996072... | ARDL(1, 4)    |
| 10    | 63.0127087... | -5.27388... | -5.02591... | -5.21546... | 0.995839... | ARDL(3, 0)    |
| 5     | 63.1172950... | -5.19248... | -4.89492... | -5.12238... | 0.995620... | ARDL(4, 0)    |

Source: Author's Calculation through E-views

## APPENDIX C

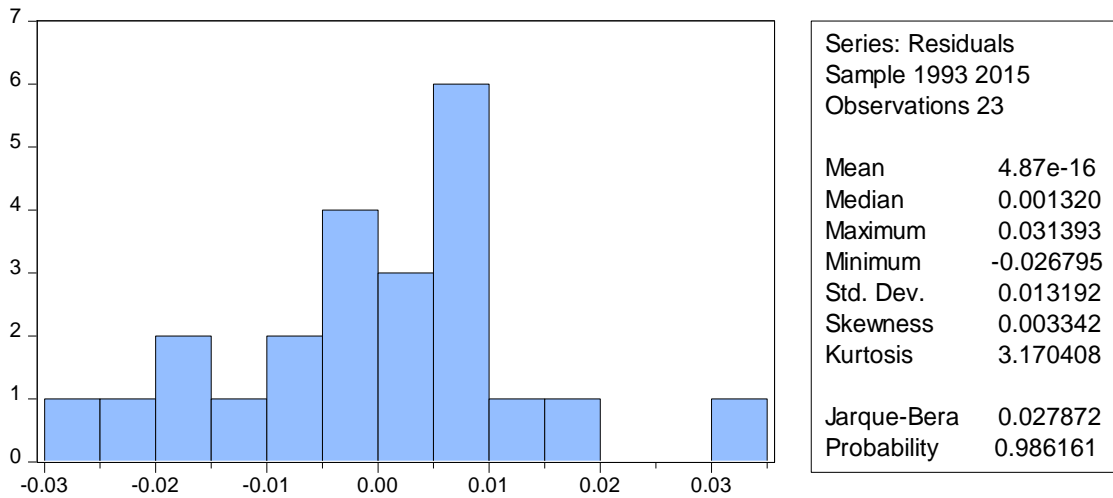
### Coefficient of Short Run Relationship in the ARDL Cointegration (3,1) Form

| Variable   | Coefficient | Std. Error | t-Statistic | Prob.* |
|------------|-------------|------------|-------------|--------|
| LNRGDP(-1) | 0.655034    | 0.229298   | 2.856699    | 0.0109 |
| LNRGDP(-2) | -0.006308   | 0.293030   | -0.021526   | 0.9831 |
| LNRGDP(-3) | 0.300565    | 0.233337   | 1.288118    | 0.2150 |
| LNRFI      | 0.009012    | 0.006119   | 1.472925    | 0.1590 |
| LNRFI(-1)  | 0.008846    | 0.005594   | 1.581460    | 0.1322 |
| C          | 0.577578    | 0.237358   | 2.433359    | 0.0263 |

Source: Author's calculation through Eviews

## APPENDIX D

### Normality Check of the ARDL (3,1) Co integration Model



Source: Author's Calculation through E-Views

## APPENDIX E

### Breusch- Godfrey Serial Correlation LM Test for ARDL (3,1) Cointegration Form

| Lag length | F-statistics | Obs.R-square | Probability | Chi-square |
|------------|--------------|--------------|-------------|------------|
| 1          | 2.841        | 3.468        | 0.1113      | 0.0625     |
| 2          | 1.520        | 3.87         | 0.2505      | 0.1440     |
| 3          | 1.137        | 4.50         | 0.36        | 0.2115     |
| 4          | 1.10         | 5.854        | 0.3933      | 0.2103     |

Source: Author's Calculation through E-Views.

## APPENDIX F

### Heteroscedasticity Test Breusch- Pagan-Godfrey for ARDL (3,1) Model Cointegration Form

| F-Statistics | Observed R Squared | Scaled Explained SS | Probability F (5,17) | Prob. Chi Square (5) | Prob. Chi Square (5) |
|--------------|--------------------|---------------------|----------------------|----------------------|----------------------|
| 1.495236     | 7.025285           | 4.165023            | 0.2432               | 0.2188               | 0.5259               |

Source: Author's Calculation through E-Views.

## APPENDIX G

### Ramsey RESET Test

| Specification: LNRGDP LNRGDP(-1) LNRGD(-2) LNRGDP(-3) LNRFDI LNRFDI(-1) C |                |            |
|---|----------------|------------|
| Lag   | F- Sstatistics | Probabilty |
| 1   | 0.2432         | 0.6285     |
| 2   | 0.2655         | 0.7703     |

Source: Author's calculation



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